

# The Nexus between Productivity and Employment

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**Abstract-** The paper tried to explore the various studies on the nexus between the productivity growth and the employment through VAR model of Dritsakis(2012) and Blanchard, Solow and Wilson(1995) model and found cointegration and causality but the association went to either direction. In the short run, the nexus was seen negative but not in all countries and in the long run, the association was found both positive and negative in the world economies like Europe, America, Africa and in Asia. No general conclusion could not be drawn on the nexus because state of technology, employees benefit, wage structure, hours of labour vary from country to country whether it was in USA, France, UK, India or in EU. Even, the association is different from sectors to sectors. Above all, if the scale of measurement of labour productivity differs, the association between labour productivity and employment may also differ.

**Index Terms-** Labour productivity, Unemployment

## I. INTRODUCTION

Productivity affects unemployment through two different mechanisms: On one hand, an increase in productivity leads to a decrease in the demand for labour for a fixed output level. An increase in unemployment would lead to a decrease in the aggregate demand. On the other hand, an increase in productivity leads to a decrease in the cost of the production and lower product prices. These lower prices could boost the aggregate demand leading to an increase in employment. The popular view is that the relationship between productivity and employment has changed from time to time, sometimes optimistic and sometimes pessimistic. Faster productivity growth is good for employment. The nexus between labour productivity and employment in the real world become inconclusive because no general relationship was found in the economies. In the short run, the positive association was observed in several nations and thereafter it turned into negative relation. The employment scenario in countries are different due to differential economic conditions, the wage structure, labour benefit, hours of labour, the technological progress etc. In the long run, the technology changes, and the productivity changes too. Several VAR model could not drawn any econometric association that is valid as general theory in the light of making any linkage in the long run analysis. However, many studies were done in US and European economies to find out the proper nexus. In this paper, we will try to evaluate some of the researches on the nexus between the labour productivity growth and the employment in general including empirical supports of those studies.

## II. MODELS AND OBSERVATIONS

In order to test the causal relationship, we specify the following multivariate VAR model,  
 $U = (WR, CPI, LP, UR, GDP)$

Where, WR is real wages, CPI is consumer price index, LP is labour productivity, UR is unemployment rate, GDP is gross domestic product and U is a vector.

This VAR model was estimated through Johansen (1988) and Johansen and Juselius (1990) cointegration test technique which suggest that labour productivity and unemployment rate is cointegrated in the order of (1,1) satisfying the trace statistics and it has a strong causal relation as per causality test based on vector error correction modeling. Granger causality tests based on error correction models (ECM) showed that there is a 'strong' Granger causal relation among labour productivity, real wages, rate of unemployment and gross domestic product as well as between real wages and unemployment rate and also among unemployment rate, real wages and gross domestic product. (Dritsakis, 2012)

We can mention two similar studies. Firstly, Chletsos, Kollias, and Manolas (2000) investigated the relationship between employment, growth rate, labour productivity and wages rate in the case of Greece for the period 1970-93. This period is divided into two sub-periods 1970-1980 and 1981-1993. In the first period they indicate that the employment level is positively related to the growth rate and wages rates are negatively related to the labour productivity. The reverse result is observed in the second period, which is characterized by the restructuring of the Greek economy. Secondly, Hsing (2001), based on the augmented Phillips curve and the autoregressive conditional heteroscedasticity model, studied the impact of the union wage increases to non-union wages and found that the growth of non-union wages is positively associated with the expected inflation productivity growth and negatively correlated with the unemployment rate.

Following Blanchard, Solow and Wilson(1995) model, let us assume,

$y = \log$  of current output

$e = \log$  of employment

$x = \log$  of productivity

$y^* = \log$  of potential or natural or normal

$y^* = \log$  of potential output (real GDP)

by definition,  $x = y - e$

then,  $x^* = y^* - e^*$

if there is an exogenous shock to  $x^*$  or to its rate of growth, how does that affect the time path of  $e$ ? In Okun's Law,  
 $e - e^* = k(y - y^*) + (e_{-1} - e_{-1}^*)$  where  $k < 1$ ,

ie, when output falls below potential in recessions, employment falls proportionately less, so that productivity falls below in normal level.

$$\text{If } g = x - x_{-1} \text{ and } g^* = x^* - x^*_{-1}$$

Then  $g$  = observed rate of productivity growth  
 $g^*$  = rate of growth of underlying supply side determined productivity trend

$$\text{So, } g = m(\Delta e - \Delta e^*) - b(\Delta e_{-1} - \Delta e^*_{-1}) + g^* \quad \dots(1)$$

$$\text{Or } g = -m(\Delta u - \Delta u^*) + b(\Delta u_{-1} - \Delta u^*_{-1}) + g^* \quad \dots(2)$$

Here  $m = (1-k)/k$  and  $b = a/k$

$\Delta e$  = current rate of growth

$\Delta e_{-1}$  = lagged rate of growth

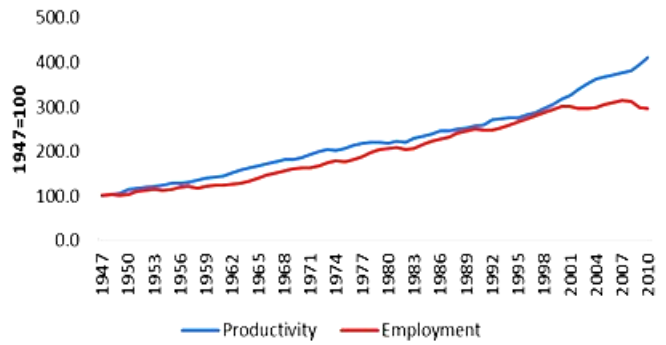
Equation (1) expressed that if we knew the time path of the potential or normal or natural or equilibrium level of employment, we could isolate the supply-determined rate of growth of productivity by estimating (1) and looking at the residuals. We can assume that the equilibrium rate of unemployment  $u^*$  is approximately constant in the same period, or else that it follows a random walk with no drift. If (2) can be estimated, the residual from the regression will be fair approximation to  $g^*$ .

Firstly, estimating (2) we get the time series representation of  $g^*$  and secondly we can explore the relation between unemployment and calculated autonomous shock to productivity growth.

From the data, there is no random walk with no drift in US and Japan. In European economies, constancy (or stationarity) of  $u^*$  is a much more dubious proposition. Observed unemployment rate has been much higher in the late 1970s and 1980s than before. The Impulse Response Function calculated from Germany and US economy –the cumulative changes in unemployment rate following a one standard deviation shock to productivity growth. In USA,  $\bar{g} = 0.4\%$ , or a bit over 1.5% per year. The quarterly standard deviation is 0.8%, so a one standard deviation jolt to productivity change for a quarter would cumulate to 3.2% if prolonged through a year. Remarkably they concluded that in the short run, an increment to productivity growth is likely to be accompanied by a small increase in unemployment but it is temporary. The permanent effect seems to be trivially small. In great depression the key to high employment does not lie in the rate of productivity growth but in a demand for aggregate output that fully uses normal productive capacity.

Jared Bernstein (2011) has studied on the historical relationship between productivity and employment in US during 1947-2010. In the Fig-1, he tried to show that there is a positive, not a negative, correlation between productivity and job growth overtime. But look at the end of the graph. Productivity accelerates while employment growth decelerates. And that ain't no blip either and it suggests the possibility of a structural change in this relationship.

**Fig-1: Productivity and employment during 1947-2010**



Source-Bernstein,2011

Productivity is a measure of the ability to create goods and services from a given amount of labour, capital, materials, land, knowledge, time, or any combination of these. It is measured, basically, as output per unit of input, where the input could be land, labour, capital, etc. When productivity is growing, living standards tend to rise. However, this is not always the case. Productivity growth can also occur during periods of recession and increased unemployment as businesses cut jobs and seek to become more efficient.

From ILO statistics, it was observed that during 1995-2000, 2000-2005, 2005-2008 and 2009, world economy did not show any clear positive or negative association between the employment and labour productivity growth. However, from 1995-2000 to 2000-2005, world labour productivity growth fell but employment change rose which was clearly observed, ie a negative association. On the other hand, in North America during the same period, the relationship was found as positive. In Africa also, the nexus between productivity growth and employment change became positive for long period only. The same conclusion can be drawn in case of India as like as Africa. In Asia Pacific nations, during 1995-2000 and 2000-2005, the nexus showed positive and in Australia, during 2000-05 and 2005-2008, the nexus was found direct. In SAARC region during 1995-2000 and 2000-2005, the association was positive (including India) but in ASEAN this was reverse in the same period. In high income economies, the relationship is direct in the same period and then no nexus was clearly seen. (Table-1)

**Table-1: Employment and productivity**

	Employment change %				Labour productivity growth % per year			
	95-00	00-05	05-08	2009	95-00	00-05	05-08	2009
China	1.2	1.2	0.5	0.6	3.4	10.6	10.5	8.4
Japan	-0.1	-0.2	0.2	-2.6	1.4	1.7	0.9	-3.8
India	1.9	2.0	2.2	1.7	4.3	4.4	5.9	5.4
Australia	1.7	2.1	2.0	-0.5	2.1	1.1	1.0	1.2
Asia-Pacific	1.5	1.7	1.5	1.1	2.4	3.9	5.3	1.4
ASEAN	2.2	1.6	2.1	1.6	0.4	3.5	3.4	-0.4
SAARC	2.1	2.7	2.6	2.2	3.3	3.8	4.9	4.8
High	0.3	0.4	0.7	-0.9	1.7	1.9	1.4	-2.3

income economies								
Africa	2.9	3.1	3.2	2.5	0.6	1.5	2.6	-0.2
North America	1.9	0.7	1.0	-	2.3	1.8	0.8	1.1
World	1.7	1.8	1.8	0.7	1.9	1.7	2.5	-1.4

Source-ILO

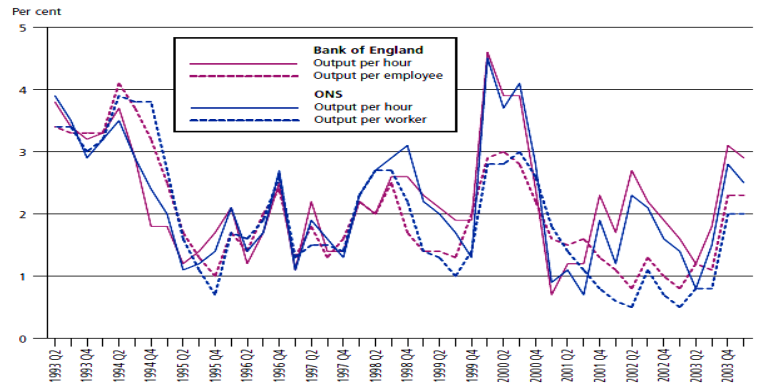
Research study observed that U.K. productivity growth over the past 30 years has averaged around 2 per cent per annum. Three researches have been done which suggest that this recent productivity growth is faster than in the 80 years from 1870 to 1950, when output per hour grew by 1.25 per cent per annum, but it has been slower than in 1950-73 when it was nearer 3 % . Allowing for this, long-term trend U.K. productivity growth does appear to be around 2 per cent per annum.

Figure 2 shows productivity growth over the period 1993-2003 as measured by both of the ONS measures and both of the Bank of England measures. Annual productivity growth started the period at 3-4 per cent (depending on the measure) before declining sharply to 1-2 per cent by 1995 where broadly it stayed until 1998. There was a slight pick-up (to 2.5-3.0 per cent) in 1999, and then growth fell back again before climbing sharply in 2000, reaching 3-4 per cent again. This was then followed by a sharp fall in 2001, with most measures seeing growth approaching just 0.5-1.0 per cent, and growth has now returned to around 2-3 per cent per annum.

The main difference is between the per person measures and the per hour measures. The per hour measures both peak at a slightly lower rate of growth in 1994 (3.5 per cent compared with the 4.0 per cent growth seen in the per person series) and they both show noticeably stronger growth in 2000. In 2000, the per hour measures shows growth of around 4.0 per cent, compared with around 3.0 per cent on the per person measures. This reflects the fact that while the year to 2000 saw ongoing strong growth in employment levels, there was slower growth in actual hours worked. Indeed, in the year to first quarter 2002, the LFS age 16 and over employment level increased by 1.2 per cent, but total actual weekly hours worked actually fell by 0.4 per cent.

In Fig-2, productivity growth in UK during 1993-2003 is shown in per person and per hour measure which is found cyclical in nature .Also Fig-2 suggests that the different measures show a similar story for the UK, and this is also the case for international comparisons of productivity. For example, it is well documented that there appears to be a productivity gap between the UK and its international competitors, with the UK lagging behind. The extent of the gap varies according to the measure used, but not significantly. On an output per worker basis, the G7 average in 2002 was around 13 per cent higher than the UK figure; on an output per hour basis the gap was around 12 per cent. Moreover, this gap is spread across a wide number of industries: a 2003 Sector Skills Development Agency report showed that out of 30 industries UK productivity was below that in the USA in 26 industries, below France in 25, and below Germany in 21.(Lindsay,2004)

Fig-2: Productivity growth in U.K.



Sources: National Accounts; Labour Force Survey; Bank of England

Table-2: Labour productivity components seasonally adjusted in UK

	Output		Productivity jobs		Productivity hours	
	Change on quarter a year ago	Change on previous quarter	Change on quarter a year ago	Change on previous quarter	Change on quarter a year ago	Change on previous quarter
2009Q3	-3.6	0.3	-1.6	0.0	-2.4	-0.6
Q4	-0.9	0.5	-1.5	-0.1	-0.8	1.4
2010Q1	1.0	0.4	-1.5	-0.4	-1.3	-2.3
Q2	2.1	0.9	0.3	0.8	0.5	2.0
Q3	2.4	0.6	0.9	0.6	1.1	0.0
Q4	1.5	-0.5	0.7	-0.3	0.2	0.5
2011Q1	1.6	0.5	1.7	0.6	2.5	0.0
Q2	0.8	0.1	0.8	-0.1	-0.7	-1.2
Q3	0.7	0.6	-0.3	-0.5	0.1	0.8
Q4	0.9	-0.3	0.1	0.1	-0.2	0.2
2012Q1	0.2	-0.2	0.1	0.6	0.6	0.8
Q2	-0.3	-0.4	0.9	0.7	2.3	0.5
Q3	0.1	0.9	1.6	0.2	2.6	1.1

Source-Office for National Statistics

Several studies have found that UK labour productivity particularly lags the USA, France and Germany in manufacturing and there are also lags in distributive trades, and finance and business services. By comparison, Britain leads the way in mining and extraction productivity.

In France, productivity increased at an average rate of 4.75% per year during 1960-1974 and the unemployment rate averaged about 2% .Between 1974 and 1990, the rate of productivity growth fell to 2.5% a year, and the unemployment rate rose fairly steadily to more than 10% .Other countries, experienced the same conjunction of slower productivity growth and higher unemployment during the later period.

It would be wrong to conclude from this observation that an autonomous increase in productivity or acceleration of productivity growth would be followed by higher employment or faster employment growth. In Table-3, there is no significant long run relationship between productivity growth and unemployment in France. The rank correlation is -0.43. The relationship is very weak . In USA, rapid productivity growth is associated with high unemployment is not always true in the long

run. The rank correlation is -0.73. The overall association is weak.

**Table-3: Productivity and unemployment: USA & France**

USA			France		
year	Productivity rate	Unemployment rate	year	Productivity rate	Unemployment rate
1870-1880	2.28	-	1896-1900	2.0	2.93
1880-90	1.86	-	1900-1906	0.1	2.79
1890-1900	1.96	10.4	1906-1913	3.3	2.06
1900-13	1.98	4.7	1913-1919	-3.6	-
1913-29	2.39	4.8	1919-1930	5.5	2.58
1929-1938	0.74	16.8	1930-1939	-0.4	6.71
1938-50	4.03	5.7	1939-1946	-2.5	-
1950-60	2.41	4.5	1946-1958	5.9	2.0
1960-70	2.51	4.7	1958-1968	3.9	2.17
1970-79	1.92	5.9	1968-1974	6.2	3.39
1979-1990	0.80	7.1	1974-1985	3.1	8.35
			1985-1993	-	13.02

Source- Maddison, 1982

Developments in euro area productivity growth since the second half of the 1990s have been disappointing. Euro area labour productivity growth (as measured by real GDP per hour worked) declined from an average of 2.1% in the period 1990-1995 to only 1.2% in the period 1996-2005. At the same time, productivity growth in the United States increased strongly from 1.3% in 1990-1995 to 2.1% in 1996-2005. More recently, in the first half of 2006, productivity growth in the euro area has gained some momentum.

Second, the decline in labour productivity growth resulted from both lower capital deepening and lower total factor

productivity (TFP) growth. The former can partly be associated with the robust pace of job creation since the mid-1990s, while the latter might be partly explained by higher utilisation of lower skilled workers. The slowdown in both capital deepening and TFP growth appears to be widespread across euro area countries. Third, from a sectoral perspective, industries not producing or using intensively information and communication technology (ICT) would appear mostly responsible for the decline in average labour productivity growth in the euro area since the mid-1990s.

**Table-4: Labour productivity growth in Euro Area and the US (annual average percentage change).**

	GDP per employed person				GDP per hour worked			
	1981-90	1991-95	1996-00	2001-05	1981-90	1991-95	1996-00	2001-05
US	1.4	1.3	2.3	1.9	1.5	1.1	2.1	2.6
Euro Area	1.8	1.9	1.3	0.5	2.5	2.3	1.7	0.7
Belgium	1.7	1.6	1.4	1.0	1.9	2.3	1.6	1.3
Denmark	1.8	2.6	1.8	0.9	2.7	2.9	2.5	1.2
Germany	0.6	0.7	2.0	2.8	1.1	0.6	2.1	2.9
Spain	2.3	2.2	-0.2	-0.8	3.3	2.3	-0.2	-0.6
France	2.1	1.5	1.5	1.1	2.9	1.7	2.1	1.9
Ireland	3.6	2.6	3.9	2.5	3.8	3.5	5.6	3.0
Italy	1.7	1.8	0.9	-0.6	2.0	2.3	0.9	-0.2
Luxemburg	2.7	1.2	2.8	0.0	3.3	2.1	2.9	1.1
Netherlands	0.9	0.6	0.4	0.6	2.0	1.4	0.4	0.8
Austria	1.9	1.1	2.9	1.5	2.4	2.7	3.3	1.9
Portugal	1.5	2.2	2.1	0.3	1.8	2.8	3.4	0.2
Finland	2.6	2.9	2.3	1.4	3.1	2.8	2.6	1.5

Source-ECB

The main developments in euro area productivity growth are summarised as follows (Table 4). While productivity growth was broadly unchanged between the 1980s and the first half of the 1990s, both in the euro area and the US, a substantial change can

be observed in the second half of the 1990s. In the euro area, average productivity growth (per hour worked) declined to 1.7% in the period 1996-2000 and further to 0.7% on average in the period 2001-2005. This is clearly lower than the 2.5% and 2.3%

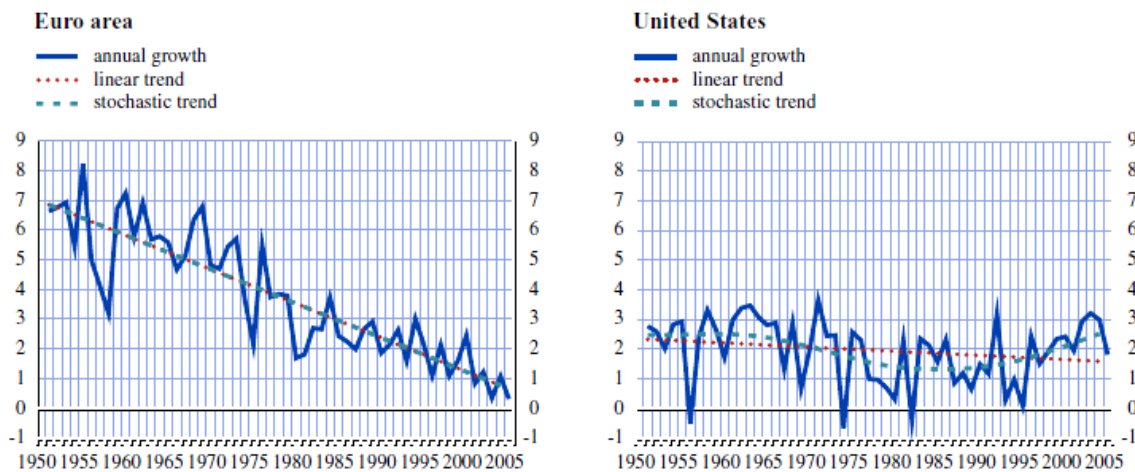


recorded respectively in the 1980s and in the first half of the 1990s. By contrast, in the US, growth in productivity per hour worked rose to an average of 2.1% in the period 1996- 2000 and to 2.6% over the period 2001-2005, a level of growth clearly above that experienced in the past. This rise in the US may partly reflect cyclical factors, but the apparent resilience of productivity growth during the past downturn and the significant further pick-up over the last two years tends to support the widespread view that the mid-1990s marked a structural improvement in US productivity growth. As a consequence, euro area labour productivity growth per hour worked fell in recent years clearly behind that in the US – for the first time in several decades.

In Fig-3 left panel, it is shown that the Euro Area long-run labour productivity growth (measured in terms of real GDP per hour worked) has been subject to a gradual declining trend since

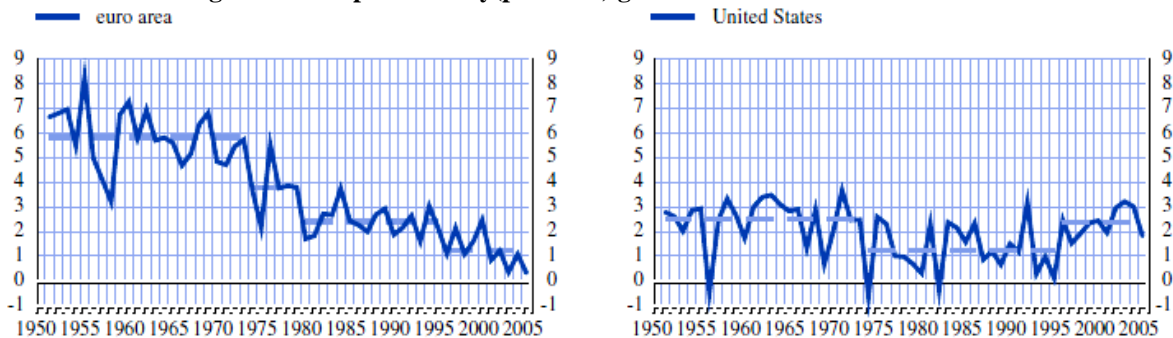
at least 1950 .Thus, from levels close to 6% in the 1950s and 1960s, labour productivity growth in the euro area decreased on average to levels around 4% in the 1970s, 2.5% in the 1980s and 2% in the 1990s. From 2001 to 2005 it was on average just below 1%. Over the whole sample period, US labour productivity growth has fluctuated around an average of 2%. At the same time, some structural changes can also be observed for the North American economy. First, to some extent the US economy also experienced a productivity slowdown from the mid-1970s to the mid-1990s. Second, reflecting the impact of recent advances in information and communication technology associated with the “new economy”, from the mid-1990s labour productivity growth in the US rebounded and started to follow an upward trend.(Fig-3, right panel).

**Fig- 3: Labour productivity (per hour) growth in Euro Area and the US(%)**



Source-ECB

**Fig- 4:Labour productivity(per hour) growth in Euro Area and the US**



Source-ECB

In Table-5, the structural breaks of labour productivity growth of Euro Area during 1951-2005 were found in 1973,1979, and 1995 respectively which was marked in the Fig-4 left panel. The mean growth rates were also shown whose average was calculated as 3.4% and the trends were broadly constant and decreasing in the respective periods. On the other

hand, the structural breaks in the labour productivity trend during the same period were marked in 1973 and 1995 respectively in USA which was shown in Fig-4 under right panel. The average mean growth rate was observed as 2.02% and the trend patterns were broadly constant.

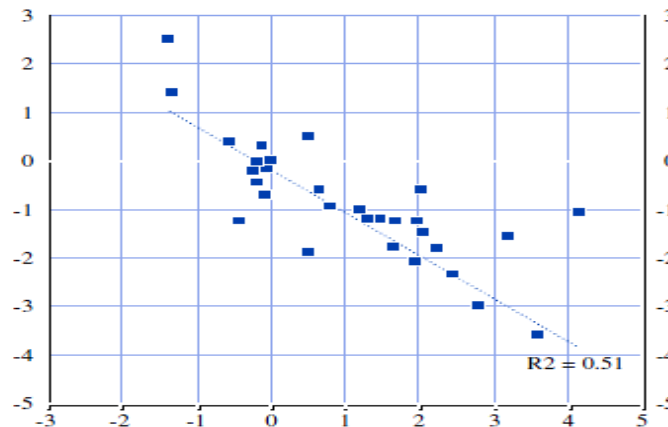
**Table-5: Basic properties of labour productivity (per hour) growth (%) in Euro Area and the US**

	Breaks	Mean growth rate	Trend
Euro Area	1973,1979,1995		
Overall 1951-2005		3.8	Broadly constant
1951-1973		5.8	Broadly constant
1974-1979		3.8	Decreasing
1980-1995		2.4	Broadly constant
1996-2005		1.2	Decreasing
USA	1973,1995		
Overall 1951-2005		2.0	Broadly constant
1951-1973		2.5	Broadly constant
1974-1995		1.2	Broadly constant
1996-2005		2.4	Increasing

Source-ECB

Moreover, in non-ICT industries in Euro Area, the nexus between the changes in labour productivity and employment growth was estimated as negative and found statistically significant during 1990-95 and 1996-2002 respectively and it is shown in Fig- 5.

**Fig- 5 : Labour productivity change and employment growth (%) in Euro Area**

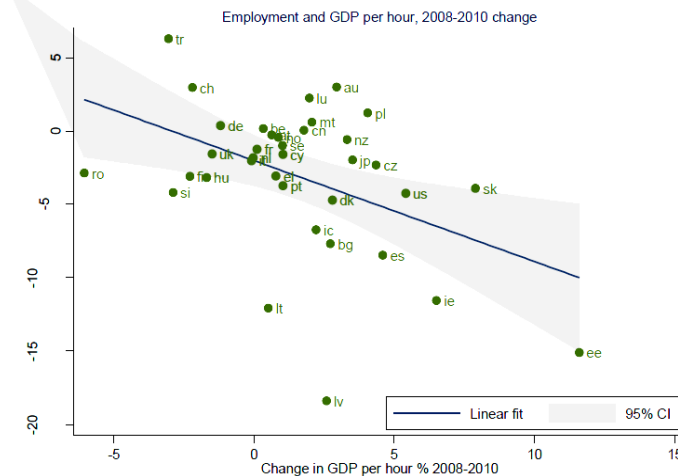


Source-ECB

The significant study on the development of employment and labour productivity in the years 2008-2010 when recession had started in most countries was shown in Fig-6. This figure shows the empirical association of a likely employment/productivity trade-off in the short run. Employment levels fell proportionately less in countries experiencing short-run reductions in labour productivity, in particular in Germany where employment increased by 0.4%, while GDP per hour decreased by 1.2%. Employment losses were greatest in countries with substantial increases in productivity at the same time. Such changes occurred in most of the eastern EU member states, but also in

Ireland and Spain (and the US), where unemployment increased substantially because public policies like short-time work compensation did not mitigate the employment impact of the recession. The adjustments in Ireland and Spain both included massive employment losses despite the differences between a liberal and a southern European type of welfare state, reflecting different adjustment process, particularly in Spain, where flexibility was achieved primarily through the reduction of fixed-term employment: unemployment increased to more than 20% of the total labour force in Spain and to 15% in Ireland, while it fell to 6.3% in Germany.

**Fig- 6:Employment and productivity during 2008-10**

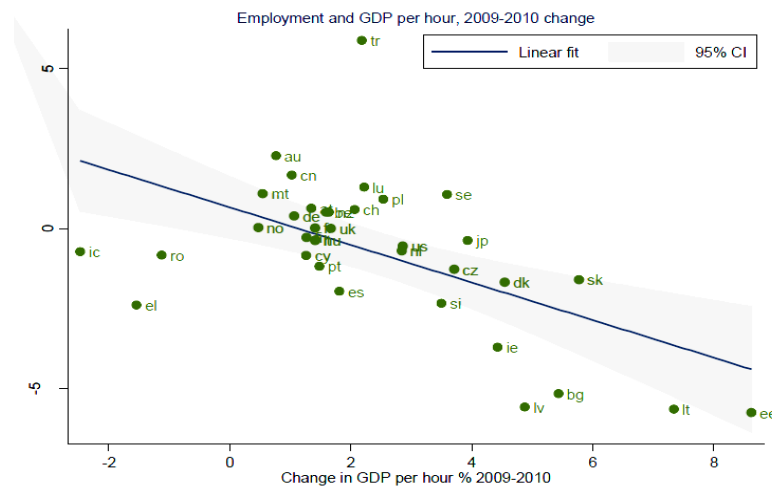


Source-Gomez-Salvador, Musso, Stocker & Turunen, 2006

By the end of the recession in most countries in 2010, the differential labour market effect of decline in economic activity can be seen even more clearly (Fig-7). In contrast to the period at the beginning of the recession, productivity increased in 2009-10 in all countries with exception of Ireland, Romania and Greece, but there is also persistent evidence of the employment-productivity trade-off, with countries tending to record either large increase in productivity and employment decline (eg, eastern European EU member states, Ireland) or smaller increases

in productivity and stable or increasing employment (Germany, France and the UK). The only major economy achieving both substantial increases in productivity as well as employment during 2009-10 is Poland, but it is also worth noting that there was also worth noting that there was also a very substantial and fast-reduction of the foreign value of the Polish currency over this period, resulting in substitution for domestic goods and following the recession, strong export growth.

**Fig- 7 : Employment and productivity growth: Emerging from recession, 2009-10**



Source- Gomez-Salvador, Musso, Stocker & Turunen, 2006

The study of Beaudry and Collard (2002) motivated by a set of cross-country observations on labor productivity growth among industrial countries over the period 1960–1997 and showed that over this period, the speed of convergence among industrialized countries has decreased substantially while the negative effect of a country’s own employment growth (or labor force growth) on labor productivity has increased dramatically.

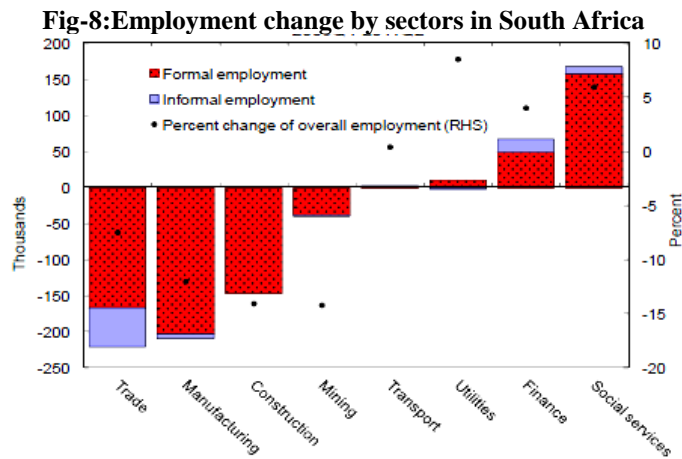
Most noteworthy study of George L. Perry (2002) showed that over the postwar period, the average hours worked per year per employee show clear cyclical fluctuations as well as a persistent downward trend. The cyclical fluctuations demonstrate

mainly that employers vary average hours as well as employment in response to changes in their own demand for labor. Higher unemployment rates mean less overtime and an increase in short workweeks of employment. Surprisingly, average hours declined sharply again in the 1965-68 period. Because there are persistent differences in the relative number of average hours worked by different age-sex groups in the labor force, the changing mix of employment contributes to the trend in economy-wide average hours of work. In order to isolate underlying trends in average hours from the effects of the changing employment mix, he eliminated the annual change in hours that was due purely to

changes in the relative mix in employment. The resulting series was then explained by its statistical relationship to the weighted unemployment rate and time trends. According to his estimates, a fall of 1 percentage point in the weighted unemployment rate causes a 0.20 hour rise in average weekly hours worked per employee; or, equivalently, there is a 0.18 hour rise for a fall of 1 percentage point in the official unemployment rate. The time trends indicate that, with a constant weighted unemployment rate, average weekly hours fall by 0.21 hour per year from 1948 to 1955, by 0.14 hour per year from 1955 to 1965, by 0.27hour per year from 1965 to 1968, and by 0.14 hour per year thereafter. The labour productivity growth and employment relationship had differential impacts in various sectors in an economy. The sectoral effects were studied by Nir Klein(2012) in South Africa which showed that in absolute terms, most of the job shedding in the non-agricultural sector occurred in formal employment, particularly in manufacturing, trade, and construction, while in

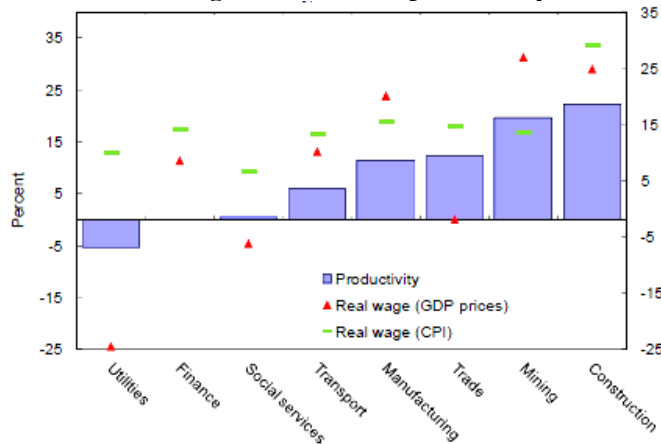
social services, finance, and utilities, employment increased (cumulative terms, Fig-8). At 2011Q2, informal employment (excl. agriculture) remained slightly below its pre-crisis level, reflecting a significant recovery in 2010, which almost offset the massive decline during 2009.

The sectors' employment and output patterns imply that most of them recorded labor productivity gains since 2008Q4 (Fig- 9). On average, the cumulative increase during this period was 8.25 percent, and the most prominent increase was recorded in construction (22 percent), reflecting the non-trivial decline of 12 percent in employment and a 7 percent cumulative increase in its added value. Productivity in social services and finance remained flat owing to a proportional increase in labor and output. The cumulative decline in labor productivity in the utilities largely reflects the relatively sharp increase in employment since 2008Q4 (9 percent).



Source-IMF

**Fig- 9 : The cumulative growth of labour productivity in South Africa**



Source-IMF

### III. CONCLUDING REMARKS

But is it really true that productivity growth leads to jobs losses? The McKinsey Global Institute says the answer is no. In a recent [report](#) entitled “Growth and Renewal in the United States:

Retooling America’s Economic Engine,” MGI argues not only that gains in productivity have usually gone hand-in-hand with job growth, but also that greater productivity gains are absolutely crucial to maintaining American growth, and therefore, job creation and prosperity.If we look just at the last two decades and



aim to recapture the 2.8 percent growth in GDP of that period, labor productivity growth needs to increase from 1.7 percent per year to 2.3 percent—an acceleration of 34 percent.

But does that mean jobs will be sacrificed in the quest for productivity gains? MGI says just the opposite is true. Historically, productivity gains and job creation have moved upwards together. Since 1929, every ten-year rolling period except one has recorded increases in both US productivity and employment. And even on a rolling annual basis, 69 percent of periods have delivered both productivity and jobs growth. Why has that been the case? MGI explains: There are three reasons that productivity and job growth can—and often do—complement each other. First, there is the cost savings point. Cost-reducing productivity gains can, on aggregate, lead to higher employment if consumers benefit from those savings in the form of lower prices and spend them. Second, productivity growth is not only about reducing inputs for given output. Importantly, it is also about increasing the quality and value of outputs for any given input. Third, sustaining global competitiveness in many tradable industries requires ongoing productivity gains; strong productivity performance is therefore a necessary condition for attracting and maintaining local jobs.

The “virtuous cycle” between productivity gains, job growth and strong economic performance was on full display as recently as the 1990s, as MGI explains:

The productivity acceleration and rapid GDP growth that the United States enjoyed in the second half of 1990s was enabled by solid gains in both sources of productivity growth. Two sectors—large-employment retail, and very high-productivity semiconductors and electronics—collectively contributed 35 percent to that period’s acceleration in productivity growth. This helped the private sector boost its productivity growth from 1 percent in 1985 to 1995 to 2.4 percent in 1995 to 1999. At the same time, these two sectors added more than two million new jobs.

The largest productivity gains since 2000 have come from sectors that experienced substantial employment reductions. Computers and related electronics, the rest of manufacturing, and information sectors have contributed around half of overall productivity growth since the turn of the century but reduced employment by almost 4.5 million jobs—more than 85 percent of which occurred before the onset of the recession. The sectors that added the most employment during this period tended to be ones with below-average productivity—notably the health sector. What the United States needs is to return to the more broadly based productivity growth that the economy enjoyed in the 1990s. During that period, strong demand and a shift to products with a higher value per unit helped to ensure that sector employment expanded at the same time that productivity was growing—reigniting the virtuous cycle of growth in which productivity gains spur increased demand, in turn leading to higher economic growth.

We can raise productivity (output per worker) by either cutting workers (ie, reduce the denominator) or increasing the value of output per worker (increase the numerator). In the 1990s, many sectors were able to innovate and raise the value of output per worker. This can happen by increasing the performance of products (think computers), shifting to higher-value goods (think retail), or redesigning processes to enable

workers to do more (think Walmart). In the 2000’s, some of the highly productive sectors used technology and automation to instead replace labor (think manufacturing) innovation is the key — developing new and better products that will spur demand.

We also find a strongly robust negative correlation between growth in labour productivity and growth in employment per capita across all of Europe, not just in Italy and Spain. We identify this effect using the following strategy. While it is obviously the case that there is two-way causation between productivity and the employment rate (since productivity drives wages), changes in labour taxes should have no direct effect on productivity. Rather, the tax effects should be mediated through employment. Using labour taxes as an instrument, we find a strong and robust negative relationship between productivity and employment. This same relationship has also been noted by Beaudry and Collard (2002), as well as Pichelmann and Roeger (2008). We go beyond their work by relating this trade-off to the post-1995 productivity slowdown. European reform agenda may raise employment per capita but may also reduce productivity. We find that some reforms, such as lowering labour taxes, may only have small short-run effects on output per capita after their effects on productivity are taken into account.

We find that the revival of European employment growth can help explain why European productivity slowed. But we do not explain why European productivity growth did not accelerate as occurred in the US. US productivity took off after 1995, growing at 0.7 percent faster per year.

Policymakers who want a quick fix that will rapidly raise both employment and productivity should find a tool other than labour market liberalisation. Liberalisation should be expected to provide long-run benefits, but there will be noticeable short-run costs. We hope that politicians in Europe and elsewhere have the fortitude to propose these policies even if the benefits may take years to fully accrue.

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